



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,952	12/01/2005	Peter James Mawle	M03B107	6744
71134 7590 09/24/2009 Edwards Vacuum, Inc. 2041 MISSION COLLEGE BOULEVARD SUITE 260 SANTA CLARA, CA 95054				
EXAMINER WU, IVES J				
ART UNIT		PAPER NUMBER		
1797				
MAIL DATE		DELIVERY MODE		
09/24/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/541,952

Applicant(s)

MAWLE, PETER JAMES

Examiner

IVES WU

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

- (1). Applicant's Amendments and Remarks filed on 6/17/2009 have been received.
Claims 9 and 12 are amended.

The objection of claim 9 in prior Office Action dated 1/2/2009 is withdrawn in response to present Amendment.

The rejection of claim 12 is revised in response to present Amendment and present together with rest of claims in the following.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

- (2). **Claims 1-2, 4-14** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tran et al (US 6309532B1), evidenced by Dingman, Jr. et al (US 6071484A).
- (3). **Claims 1-2, 4-11** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tran et al (US 6309532B1), evidenced by Dingman, Jr. et al (US 6071484A) for the rationale recited in prior Office Action dated 1/3/2009.

As to an essential closed loop circulation system containing a gas scrubbing unit and an ion absorption unit comprising a water permeable ion absorbing means for enabling an electrical potential to be applied across the thickness of ion absorbing means in an apparatus for treating gaseous chemical waste in **independent claim 12**, the disclosure of Tran et al, Dingman, Jr. et al is incorporated herein by reference, the most subject matters as currently claimed, have been recited in Applicant's claim 1, and have been discussed therein.

As to a pump for continuously circulating water around the closed loop in **independent claim 12**, it would be obvious to have a pump for recirculation as evidenced by Dingman, Jr. et al in Figure 2 including a pump unit.

As to an inlet for exhaust gas or reaction product thereof into the gas scrubbing unit; an inlet for water into the closed loop circulation system; an outlet for concentrated aqueous solution of ionic species from ion absorption unit in **independent claim 12**, it would be obvious

to have an inlet for exhaust gas into the gas scrubbing unit in order to scrub the gas. It also would be obvious to have inlet for water in circulation system in order to provide the water. As shown in Figure 22 of Tran et al the outflow which reads on the feature of instant claim.

As to a quantity of the concentrated aqueous solution removed from outlet is replenished by adding water into the closed loop circulation system in independent claim 12, the disclosure of Tran et al, Dingman, Jr. et al is incorporated herein by reference, the most subject matters as currently claimed, have been recited in Applicant's claim 1, and have been discussed therein.

As to ion absorbing means comprising a water permeable layer of ion absorbing material in claim 13, and a water permeable zone of an ion absorbing material in claim 14, Tran et al (US 6309532B1) disclose Figure 22 which include anion exchange polymeric coating and cation exchange polymeric coating to be water permeable for waste water treatment.

(4). **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tran et al (US 6309532B1) in view of Mir (US 6187162B1) for the same rationale recited in prior Office Action dated 1/2/2009.

(5). **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tran et al (US 6309532B1) in view of Keller (US 5045291), as evidenced by Tomoi et al (US 5350523A) for the same rationale recited in prior Office Action dated 1/2/2009.

(6). **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tran et al (US 6309532B1) in view of Yan (US 4795565) for the same rationale recited in prior Office Action dated 1/2/2009.

(7). **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tran et al (US 6309532B1) in view of Yan (US 4795565). Evidenced by Okada et al (US 4141828) for the same rationale recited in prior Office Action dated 1/2/2009.

Response to Arguments

(8). Applicant's arguments filed on 6/17/2009 have been fully considered but they are not persuasive. Applicant point out that none of the prior arts teaches or suggests the element "continuously adding to the closed loop a quantity of water corresponding to the quantity of aqueous solution of the ionic species removed from ion absorption unit". Tran et al (US 6309532B1) fails to teach or suggest a method "removing from the ion absorption unit a more

concentrated aqueous solution of ionic species" or an apparatus having "an outlet for concentrated aqueous solution of ionic species from the electrochemical cell 30 has only one inlet 80 and one outlet 92" (§ 5, page 7, ¶ 1, page 8). However, Tran et al (US 6309532B1) disclose potential swing continuous mode as illustrated in Fig. 7, fully automatic potential-swing operation. Capacitive deionization can, for instance, produce a continuous flow of product water by operating two stacks of carbon aerogel electrodes in parallel. One stack purifies while the other is electrically and/or chemically regenerated, preferably in the stopped flow or slow-flow modes with accompanying fast flushing. Such synchronous operation requires user-friendly automation (Col. 29, line 50-63). In a preferred embodiment during the regeneration portion of a deionization/regeneration cycle, a suitable regenerant solution is passed in sufficient quantity to replace the overall fluid volume of the cell and fluid flow then stopped for a desorption period to allow partial or essentially complete release of the previously removed ions from the electrosorptive media materials attached to the electrodes (Col. 18, line 8-14). When the cell 30 is saturated or it is determined to regenerate the cell, the deionization process can be automatically interrupted, either stopped or slowed down as the regeneration process starts. For this purpose, the power supply 117 is disconnected, reduced, or polarity reversed and a regeneration tank 170, fed deionized or partially deionized fluid from outlet line 155 through an open valve 162 when valve 157 to feed tank 150 is closed (Col. 16, line 61–Col. 17, line 2). Therefore, the outlet of cell for purified water is also for concentrated fluid in regeneration stage in continuous operation. The loss of original fluid (aqueous) during the switch from operation mode to regeneration mode would be obvious to be replenished as the CDI system is integrated with gas scrubbing and support the purification of scrubber fluid (water).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

Art Unit: 1797

Date: September 22, 2009

/DUANE SMITH/

Supervisory Patent Examiner, Art Unit 1797